

ABSTRACT

To meet the requirements for ever smaller semiconductor devices, it is required to provide a sample surface processing method which is capable of processing a device
5 of 1 micron or less, or more preferably 0.5 micron or less. It is also required to provide a surface processing method which allows a flat surface to be etched without irregularities occurring on the etched surface, and permits the multilayer film to be etched without underlying oxide
10 film etched through.

To meet the requirements, a sample of multilayer film comprising at least metal and semiconductor deposited on the substrate is laid on the sample board in the vacuum container, plasma is generated inside said vacuum container,
15 and plasma treatment is provided by periodic on-off control of radio frequency bias voltage applied on said sample board, wherein the percentage of on-period is preferred to account for 5 to 60% in a cycle of on-off control of said radio frequency voltage.